INPUT

STRATEGIC MARKET FORECAST

The U.S. Electronic Commerce Market

1994 - 1999

Electronic Commerce Program

1 9 9 5

THE U.S. ELECTRONIC COMMERCE MARKET

1994 - 1999

Input
Library

INPUT®

Frankfurt • London • New York • Paris • San Francisco • Tokyo • Washington, D.C.

INPUT®

Clients make informed decisions more quickly and economically by using INPUT's services. Since 1974, information technology (IT) users and vendors throughout the world have relied on INPUT for data, research, objective analysis and insightful opinions to prepare their plans, market assessments and business directions, particularly in computer software and services.

Contact us today to learn how your company can use INPUT's knowledge and experience to grow and profit in the revolutionary IT world of the 1990s.

Subscription Services

- Information Services Markets
  - Worldwide and country data
  - Vertical industry analysis
- Systems Integration/Professional Services Markets
- Client/Server Software
- Outsourcing Markets
- Information Services Vendor Profiles and Analysis
- Electronic Commerce/Internet
- U.S. Federal Government IT Markets
- IT Customer Services Directions (Europe)

Service Features

- Research-based reports on trends, etc. (More than 100 in-depth reports per year)
- Frequent bulletins on events, issues, etc.
- 5-year market forecasts
- Competitive analysis
- Access to experienced consultants
- Immediate answers to questions
- On-site presentations

Databases

- Software and Services Market Forecasts
- Software and Services Vendors
- U.S. Federal Government
  - Procurement Plans (PAR, APR)
  - Forecasts
  - Awards (FAIT)

Custom Projects

For Vendors—analyze:

- Market strategies and tactics
- Product/service opportunities
- Customer satisfaction levels
- Competitive positioning
- Acquisition targets

For Buyers—evaluate:

- Specific vendor capabilities
- Outsourcing options
- Systems plans
- Peer position

Other Services

Acquisition/partnership searches

INPUT Worldwide

Frankfurt
Perchstätten 16
D-35428
Langgöns
Germany
Tel. +49 6403-911-420
Fax +49 6403-911-413

London
Cornwall House
55-77 High Street
Slough, Berkshire
SL1 1DZ, England
Tel. +44 (0) 1753 530444
Fax +44 (0) 1753 577311

New York
400 Frank W. Burr Blvd.
Teaneck, NJ 07666
U.S.A.
Tel. 1 (201) 801-0050
Fax 1 (201) 801-0441

Paris
24, avenue du Recteur Poincaré
75016 Paris
France
Tel. +33 (1) 46 47 65 65
Fax +33 (1) 46 47 69 50

San Francisco
1881 Landings Drive
Mountain View
CA 94043-0848
U.S.A.
Tel. 1 (415) 961-3300
Fax 1 (415) 961-3966

Tokyo
Saida Building, 4-6,
Kanda Sakuma-cho
Chiyoda-ku, Tokyo 101
Japan
Tel. +81 3 3864-0531
Fax +81 3 3864-4114

Washington, D.C.
1921 Gallows Road
Suite 250
Vienna, VA 22182-3900
U.S.A.
Tel. 1 (703) 847-6870
Fax 1 (703) 847-6872

Published by
INPUT
1881 Landings Drive
Mountain View, CA 94043-0848
United States of America

Electronic Commerce Program

The U.S. Electronic Commerce Market, 1994-1999

Copyright © 1995 by INPUT. All rights reserved. Printed in the United States of America. No part of the publication may be reproduced or distributed in any form, or by any means, or stored in a database or retrieval system, without the prior written permission of the publisher.

The information provided in this report shall be used only by the employees of and within the current corporate structure of INPUT's clients, and will not be disclosed to any other organization or person including parent, subsidiary or affiliated organization without prior written consent of INPUT.

INPUT exercises its best efforts in preparation of the information provided in this report and believes the information contained herein to be accurate. However, INPUT shall have no liability for any loss or expense that may result from incompleteness or inaccuracy of the information provided.

EEDA• 758 • 1995

Abstract

In this report, *The U.S. Electronic Commerce Market, 1994 - 1999,* INPUT describes, analyzes and sizes the current market for electronic commerce in the U.S., and forecasts how the market will change over the five-year period to 1999.

The electronic commerce market for 1994 was $4.1 billion, including EDI, E-mail, enhanced fax, electronic catalogs, and other related products and services.

The report highlights the areas that are growing most quickly, and gives trend information that allows marketing and product development programs to be targeted.

This report has 51 pages and includes 19 exhibits.

© 1995 by INPUT Reproduction Prohibited.

Table of Contents

I	Introduction	I-1
	A. Objective	I-1
	B. Scope	I-2
	C. Report Methodology	I-2
II	Executive Overview	II-1
	A. Global Business Environment	II-1
	B. Markets—Size and Growth Summaries	II-1
	C. Electronic Commerce—Expanding Scope	II-2
	D. Electronic Commerce—1994 Market and Forecast Summary	II-3
	1. EC Network Application Services	II-3
	2. EC Electronic Information Services	II-4
	3. EC Software Products—Market Size and Forecast	II-5
	4. EC Equipment—Market Size and Forecast	II-6
	5. EC Professional Services—Market Size and Forecast	II-6
III	Global Market Environment	III-1
	A. Business Environment	III-1
	B. Global Information Services Market	III-2
	C. U.S. Network Services Market	III-2
	1. U.S. Market Size	III-3
	2. Network Services by Industry Sector	III-3
	3. Network Applications Portion of the Network Services Market	III-4
	D. Driving Forces for Electronic Commerce	III-4

© 1995 by INPUT Reproduction Prohibited.

IV	Electronic Commerce Market Size and Forecast	IV-1
	A. Electronic Commerce—Expanding Scope	IV-1
	B. Electronic Commerce—1994 Market and Forecast Summary	IV-4
	C. Electronic Commerce by Industry Sector	IV-4
	D. E-Mail Market Size and Forecast	IV-6
	E. EDI Market Size and Forecast	IV-9
	F. ACH/EFT/FEDI Market Size and Forecast	IV-12
	G. E-Fax Market Size and Forecast	IV-14
	H. Credit Data Market Size and Forecast	IV-17
	I. Electronic Catalog Market Size and Forecast	IV-19
	J. Sales and Marketing Data Market Size and Forecast	IV-21
	K. Electronic Commerce Software Products Market Size and Forecast	IV-21
	L. Electronic Commerce Equipment Market Size and Forecast	IV-22
	M. Electronic Commerce Professional Services Market Size and Forecast	IV-23
V	Electronic Commerce Players' Perceptions of the Marketplace	V-1
	A. Electronic Commerce Survey	V-1
	B. Perceptions of Market Growth	V-1
	C. Impact of Key Technology and Portfolio "Events"	V-2
	D. Significant Market Changes Over This Year	V-3
VI	Conclusions	VI-1

© 1995 by INPUT. Reproduction Prohibited

Exhibits

II

-1	U.S. Electronic Commerce Markets	II-3
-2	EC Network Application Services—Market Size and Forecast	II-4
-3	EC Electronic Information Services—Market Size and Forecast	II-5

III

-1	Network Services Market—User Expenditures by Industry, 1994 - 1999	III-3
-2	Network Applications Market—User Expenditures by Industry, 1994 - 1999	III-4
-3	EC Market—Driving Forces	III-5

IV

-1	U.S. Electronic Commerce Market	IV-4
-2	1994 EC Market by Industry Sector	IV-5
-3	E-Mail Market Size and Forecast	IV-7
-4	EDI Market Size and Forecast	IV-9
-5	1994 EDI Market by Vendor Share	IV-11
-6	ACH/FEDI/EFT Market Size and Forecast	IV-13
-7	E-Fax Market Size and Forecast	IV-17
-8	Credit Data Market Size and Forecast	IV-17
-9	Electronic Catalog Market Size and Forecast	IV-20
-10	Sales and Marketing Data Market Size and Forecast	IV-21
-11	EC Software Products Market Size and Forecast	IV-22
-12	EC Equipment Market Size and Forecast	IV-22
-13	EC Professional Services Market Size and Forecast	IV-23

© 1995 by INPUT Reproduction Prohibited

(BLANK)

© 1995 by INPUT. Reproduction Prohibited.

I

Introduction

A
Objective

Electronic commerce includes a broad array of products and functionality that facilitate the consummation of transactions electronically between trading partners.

The purpose of this report is to provide an understanding of the electronic commerce marketplace, including issues, trends, and patterns that have been noted over the past year (1994). This analysis is then expanded to describe trends to be expected over the next five years—into 1999.

Over the ten-year history of INPUT's electronic commerce program, the focus has been on the EDI marketplace. The vendors included in the definition of the EDI marketplace, as it has been studied at INPUT, consisted of traditional value-added network providers and a wide array of EDI software providers who have long been associated with specific industry sectors. Some of the players in this traditional EDI market have included Transnet Rail, Inc., Harbinger and Sterling. There are as many as 200 others delivering software to a variety of niche markets. More recently, vendors have crossed the boundaries of specific sectors to provide services that have become useful across multiple industries.

In recent years, a wide range of messaging vendors have begun to include EDI in their product portfolios. In addition, other participants have entered the marketplace, including some of the large computer systems manufacturers. In this report INPUT redefines electronic commerce to take into account a wider range of players than had previously been counted.

© 1995 by INPUT. Reproduction Prohibited

B
Scope

Analysis in this report will range from 1994 through the 1999 forecast period.

Most electronic commerce is embedded within the network services marketplace, as defined by INPUT. Network services is the fastest growing submarket in the overall information services model. The largest growth contribution to network services will come from the expansion of electronic commerce services and applications.

These and related topics define the scope of this study.

C
Report Methodology

Much of the data used in this report was derived from user and vendor surveys as part of INPUT's ongoing market analysis program. Discussions regarding trends, issues, new technologies and impacts on various industry sectors were based on work found in other INPUT studies:

- *Electronic Catalogs, Online Storefronts and Internet Malls, 1995*
- *Network Services Market, 1994-1999*
- *Electronic Commerce in U.S. Health Care, 1993*
- *The Electronic Catalog Market: Status and Directions, 1993*
- *Electronic Commerce and Manufacturing, 1993*
- *Electronic Commerce and Distribution, 1993*
- *Electronic Commerce and Transportation, 1993*
- *Electronic Commerce and Government, 1993*
- *U.S. EDI Market, 1993-1998*

Trends, market sizes and growth rates are based upon INPUT research and interviews with users and electronic commerce vendors. INPUT maintains ongoing relationships with vendors for the purposes of preparing vendor profiles and maintaining updated product information.

© 1995 by INPUT Reproduction Prohibited.

Extensive use was made of INPUT's corporate library located in Mountain View, California. The resources in this library include on-line periodical databases, subscriptions to a broad range of computer and general business periodicals, continually updated files on more than 3,000 information services vendors, and the most up-to-date U.S. Department of Commerce publications on industry statistics.

Note that when displaying market forecast values in bar and column charts, INPUT rounds these amounts for ease of visual reference.

© 1995 by INPUT Reproduction Prohibited.

(BLANK)

1995 by INPUT Reproduction Prohibited

II

Executive Overview

A
Global Business Environment

This report is primarily concerned with the U.S. electronic commerce marketplace. However, to understand this market, it is important to appreciate the global business environment in which it exists.

The global recession is still very much in evidence, although the U.S. economy began rebuilding strength during 1994. Europe continues to lag in its recovery, although positive signs are appearing. Japan, on the other hand, is still in deep economic difficulty, although contraction of its economy was slightly less in 1994 than 1993.

These trends are reflected in information services markets also. Because the U.S. constitutes 54% of the worldwide total market, its strength masks some of the other regions' weaknesses when a global perspective is taken.

B
Markets—Size and Growth Summaries

Influenced by the U.S.' weighting on the global information services market, and by the fact that many countries are using information services to improve their economies and escape from the recession, the global market for information services is growing at eight percent currently, and is expected to grow at an eleven percent CAGR through 1999. This is in spite of the recessionary factors discussed earlier.

A subset of this market, and closer to electronic commerce, is the U.S. network services market. It is growing at a current rate of fifteen percent, with a projected rate of eighteen percent CAGR through 1999.

© 1995 by INPUT. Reproduction Prohibited

Within U.S. network services lies the U.S. network applications market. This is growing at an even faster rate of 20% CAGR through 1999.

Much of the electronic commerce market, in turn, is nested within network applications. As can be seen from the above, as observation moves from global information services markets to U.S. electronic commerce markets, there is a trend of increasing growth rates. The U.S. electronic commerce market is growing at a 22% CAGR through 1999, if the credit data market is excluded, or seventeen percent if it is included. (Credit data is singled out for special treatment because, although it is a rather large market, it is very mature, and growing slowly. It will therefore be of less interest to most readers of this report.)

The total size of the U.S. electronic commerce market was $4.7 billion in 1994, and it will grow to $10.2 billion in 1999.

C
Electronic Commerce—Expanding Scope

INPUT's electronic commerce program has focused traditionally on EDI, but, as markets evolve, it appears that a broader focus is now appropriate. E-mail and fax are now being used to consummate transactions, where they were once reserved only for informal and "unofficial" communication. In part, this is because of a growing acceptance of these media, and in part it is because of new technology that makes them more secure.

Electronic commerce is concerned with the completion of transactions electronically, over digital networks. It is the networking of business applications and work flows to support trade among companies. INPUT expects to see more and more companies entering this marketplace and embracing the term "electronic commerce" in the future.

Specifically, INPUT considers the following activities electronic commerce *if they are supporting inter-company communication for the purpose of initiating, promoting and completing business transactions:*

- E-mail
- Electronic data interchange (EDI)
- Electronic funds transfer (EFT)
- Automated clearing house (ACH)

© 1995 by INPUT. Reproduction Prohibited.

- Credit information
- Fax
- Electronic catalogs
- Sales and marketing information

Additionally, INPUT includes sales of relevant software products, equipment and professional services in its analysis of electronic commerce.

D
Electronic Commerce—1994 Market and Forecast Summary

As mentioned above, the U.S. electronic commerce market was measured by INPUT at $4.7 billion in 1994, with a compound annual growth rate (CAGR) of seventeen percent through 1999.

Exhibit II-1 shows further detail.

Exhibit II-1

U.S. Electronic Commerce Markets

	1993 ($M)	1994 ($M)	1993-1994 Growth %	1999 ($M)	1994-1999 CAGR %
Network Application Services	909	1054	16	3545	28
Electronic Information Services	2297	2515	9	3956	9
Software Products	362	471	30	1437	25
Equipment	500	600	20	1105	13
Professional Services	50	61	23	165	22
TOTAL	**4118**	**4701**	**14**	**10208**	**17**

Notice that the highest growth area is network application services, at 28%. The growth of electronic information services is diminished somewhat by the fact that credit data, a large but slowly growing market, is included therein.

In the body of the report, these figures are broken down and analyzed in depth. The following sections contain a summary.

1. EC Network Application Services

Exhibit II-2 shows the 1994 market size and five-year growth rate for what is defined by INPUT as network application services.

© 1995 by INPUT. Reproduction Prohibited.

Exhibit II-2

EC Network Application Services Market—Size and Forecast

	1994 ($M)	1994-1999 CAGR %
E-mail	582	25
EDI	300	17
ACH/EFT/FEDI	24	20
E-fax	148	48
TOTAL	**1054**	**28**

The total market for E-mail and E-fax is clearly larger than the above, but INPUT considers only components related to consummating inter-company commercial transactions.

E-mail is already larger, and growing more quickly, than EDI. In fact, the two markets are merging, as discussed in more detail in the body of this report. INPUT also discusses how, given this situation, EDI vendors can capitalize on their unique strengths.

E-fax is growing tremendously and will be second only to E-mail in market size by 1999. As a technology, fax has an even higher acceptance rate offshore than in the U.S.

Automated clearing house (ACH) and financial EDI (FEDI) are currently small markets. Smaller banks have not implemented the technology at the same rate as have the larger banks, so are a bottleneck in bank-to-bank transactions. It is expected that this will change over the five-year period, and that the presence of Microsoft, with its aspirations in this area, will be a catalyst.

2. EC Electronic Information Services

Exhibit II-3 shows the market size and growth rates for EC services defined by INPUT as electronic information services.

© 1995 by INPUT Reproduction Prohibited

Exhibit II-3

EC Electronic Information Services—Market Size and Forecast

	1994 ($M)	1994-1999 CAGR %
Credit Data	1534	4
E-Catalogs/Products Pricing	243	20
Marketing Data	738	15
TOTAL	**2515**	**9**

Credit data involves activity at the point of sale (POS), where payments for purchase of personal consumption items are made via credit or debit cards. Although the credit data/POS market is very large, it is also very mature, and growing slowly. The barriers for entry are also large for potential new participants, so it may be of less interest to readers of this report. For this reason, at various places in this report growth rates are presented both including and excluding credit data figures. There is a rapidly growing interest in POS services on the debit side. Debit growth is most rapid in the retail sector, especially in the grocery and oil industries.

Electronic catalogs are being used today for merchandise materials procurement, as well as information gathering and research. Revenue for electronic catalog services stem from subscription fees from buyers, listing fees to sellers, or percentages of sales for every transaction. With the emergence of the World Wide Web on the Internet, electronic catalogs are becoming very popular, and have enjoyed a growth rate of thirty-nine percent to 1994. However, this is expected to moderate over the five-year period to a twenty percent CAGR.

Electronic capture and sale of sales data for marketing purposes is a market growing at fourteen percent currently. The scope to engage in this business is much greater now than in the past, with many more transactions being performed electronically (for example, by EDI), and therefore being capturable.

3. EC Software Products Market Size and Forecast

There is a considerable market in the sale of software to organizations that use a private network between partners for EDI and other transactions. This market grew to $471 million in 1994, a growth of thirty percent over 1993. The CAGR to 1999 is twenty-five percent.

© 1995 by INPUT Reproduction Prohibited

4. EC Equipment—Market Size and Forecast

Equipment purchases related to electronic commerce include computer platforms, modems, routers and related telecommunications equipment. In 1994, they amounted to $600 million, with a CAGR of thirteen percent to 1999. Note that much equipment is purchased for multiple purposes, so the above figures are apportioned to the approximate EC usage of the equipment. The figures are therefore estimates only.

5. EC Professional Services Market Size and Forecast

Professional services for electronic commerce are third-party consulting and systems integration services performed to build electronic trading systems.

This market is quite small, at $61 million in 1994, and is growing at a twenty-two percent CAGR to 1999.

© 1995 by INPUT Reproduction Prohibited

III

Global Market Environment

A
Business Environment

This report is primarily concerned with the U.S. electronic commerce marketplace. However, it is important to have a general understanding of the global background in which the electronic commerce market is growing today.

Information services, as part of global business environments worldwide, continues to encounter the effects of the global recession that occurred earlier this decade. The North American economy, specifically that of the U.S., began rebuilding strength in early 1994. The signing of NAFTA (North American Free Trade Agreement) with Canada and Mexico was an encouraging sign that free market activity will continue to grow and perhaps spread to other nations in a revitalized form.

Europe continues to experience recessionary sluggishness. Talks between France and the U.S. regarding general trade agreements were tense and not totally successful. Reunification activity continues in the German economy, detracting from potential growth in Europe's second largest information services market.

The Japanese economy, which represents 80% of the Asia-Pacific market, suffered the most in late 1993. The information services market actually decreased 6% in 1993 in this region and rebounded slightly to only a 2% decrease in 1994. Estimates for 1995 show a modest 2% growth in information services spending. These movements reflect the effects of uncertainty in some of Japan's largest markets—including banking, real estate and discrete manufacturing.

Difficulties in Japan, however, stimulated growth in other countries in the Asia-Pacific region. South Korea and Taiwan became positive targets

1995 by INPUT Reproduction Prohibited

for Japanese foreign investment, and the People's Republic of China emerged as one of the stronger markets in the region.

The North American information services market made up 53% of the worldwide total, an increase of 3% over 1992. The U.S. accounts for 95% of this. U.S. market growth is starting to recover from the recent recession. In general, information services in the U.S. grew only 11% in 1994.

In summary, in the last two quarters of 1994, the U.S. economy showed strong signs of recovery, which are carrying over well into 1995. This improvement, however, is offset by slow economic growth in Europe and no growth in Japan, and is reflected in relatively flat global growth for the forecast period.

B
Global Information Services Market

The worldwide information services market continues to grow fairly rapidly, despite the fact that parts of the world other than the U.S. are recovering slowly from the worldwide recession.

As presented in the INPUT report, *"Worldwide Information Services Forecast, 1994-1999"*, the worldwide market for information services and software products grew from $274 billion in 1993 to $296 billion in 1994. By 1999, the market is expected to reach over $500 billion.

With a growing trend to outsource major portions of the information systems function, the market opportunity for information services vendors worldwide extends to the entire information systems budget. That includes budgets directly controlled by the internal information systems function and budgets under the control of operational departments or business units.

C
U.S. Network Services Market

The trends, issues and market sizes of the electronic commerce market correlate significantly with the network services market. Network services, as defined by INPUT, includes network application services and electronic information services. Network services is a market nested within information services, according to INPUT's model.

© 1995 by INPUT. Reproduction Prohibited

Network application services includes value-added networks, EDI, E-mail and bulletin boards. Electronic information services includes on-line databases and news services. As can be seen, much of the electronic commerce market is nested within network services. For that reason, the network services market will be described in more detail here.

1. U.S. Market Size

The U.S. market for network services grew from a 1993 level of $12.0 billion to $13.8 billion in 1994, a growth rate of 15%. The compound annual growth rate (CAGR) to 1999 is projected to be 18%—the highest of the U.S. product/service groupings.

2. Network Services by Industry Sector

Differences in the use of network services across industry sectors are pronounced, as shown in Exhibit III-1. The wholesale distribution, discrete manufacturing, retail distribution and government sectors show annual growth of 21% or more through 1999.

Expenditures in generic markets will grow more rapidly than in industry markets over the next five years. (By generic, INPUT means services that can be used in a broad or general way across industries).

Exhibit III-1

Network Services Market, 1994 - 1999

Industry Sector	User Expenditures 1994 ($M)	User Expenditures 1999 ($M)	1994-1999 CAGR %
Discrete Manufacturing	156	410	21
Process Manufacturing	1281	2780	17
Transportation	505	1205	19
Utilities	35	57	10
Telecommunications	169	420	20
Wholesale Sales	507	1521	25
Retail Sales	331	963	24
Banking and Finance	1011	2109	16
Insurance	280	530	14
Health Services	795	1712	17
Education	298	638	16
Business Services	754	1383	13
Federal Government	1219	2056	11
State and Local Government	182	468	21
Miscellaneous Industries	181	318	12
Industry-Specific Total	**7704**	**16571**	**17**
Generic Markets	**6120**	**15026**	**20**
Total Network Services	**13824**	**31597**	**18**

© 1995 by INPUT Reproduction Prohibited

3. Network Applications Portion of the Network Services Market

The U.S. network applications market (nested within network services) is a market closely related to electronic commerce because it includes EDI and E-mail. This market grew at a rate of 12%, from $2.4 billion in 1993 to $2.7 billion in 1994. Expected growth will be 20% annually to 1999, reaching $6.7 billion in that year.

Network applications expenditures account for approximately one-fifth of total network services spending, and their distribution across industry sectors can be seen in Exhibit III-2. The most rapid growth over the next five years will be seen in retail (29%) and wholesale (26%) sales, and in process manufacturing (27%).

Exhibit III-2

Network Applications Market, 1994 - 1999

Industry Sector	User Expenditures 1994 ($M)	User Expenditures 1999 ($M)	1994-1999 CAGR %
Discrete Manufacturing	81	225	23
Process Manufacturing	208	674	27
Transportation	144	366	21
Utilities	4	7	12
Telecommunications	32	85	22
Wholesale Sales	411	1330	26
Retail Sales	130	456	29
Banking and Finance	129	254	15
Insurance	72	169	19
Health Services	344	874	20
Education	104	214	16
Business Services	29	68	19
Federal Government	915	1646	12
State and Local Government	115	344	24
Miscellaneous Industries	12	24	15
Industry-Specific Total	**2730**	**6736**	**20**

Therefore, as we analyze the market from the broadest information technology to the most specific portion of network applications that relates to electronic commerce, we see the growth rates generally increasing and this product/service area becoming more promising for vendors and users alike.

D
Driving Forces for Electronic Commerce

A number of factors are influencing the growth that electronic commerce will experience worldwide. Despite general global sluggishness, these

© 1995 by INPUT Reproduction Prohibited

influences still provide an opportunity for electronic commerce vendors outside the U.S. to grow at a rate comparable to U.S. projected growth rates.

Exhibit III-3

EC Market—Driving Forces

- Flat global growth, worldwide
- Still confined by the recession
- Signs of recovery stronger in the U.S. than worldwide
- Information becoming a competitive commodity
- New technologies provide new opportunities (client/server, wireless, PCN, etc.)
- Need for integrated solutions
- Need for industry specific solutions
- Expanding telecommunications infrastructure, worldwide
- Standards process gaining momentum
- Need for IS vendors to have global capabilities

Source: INPUT

Recovery from the global recession is slow, as discussed previously; consequently, investment has slowed somewhat. Despite this, information has become a vital commodity obtained and used to increase or establish a competitive edge in both developed and developing nations.

In spite of the fact that new technologies offer opportunities for improving productivity and increasing capabilities for users, investment in technology has also been hampered by economic conditions. Ironically, the solution is sometimes out of reach due to the problem!

Disparate and incompatible software and systems exist and there is a great need for vendors with expertise in integrating different technologies into manageable and efficient solutions. Tailored software solutions are still crucial, although packaged software is gaining global market share for some vendors. Industry sector knowledge will continue to be a significant advantage.

Telecommunications networks are very important in the development of a strong economy within a country. Trading communities develop as

1995 by INPUT Reproduction Prohibited.

telecommunications infrastructures are expanded. Electronic commerce thrives as communications infrastructure improves. This is probably the single most important driving force for electronic commerce vendors to understand.

As part of the process, international standards develop, and give vendors confidence that they may gain a return on product development investment. Likewise, standards give confidence to purchasers that their investment will not become obsolete. Vendors who help define and implement standards will be in significant demand.

Information services vendors need to support the global activity of their multinational customers, regardless of their home base. Global capabilities are of crucial importance as technology enables users to conduct business beyond traditional national boundaries.

1995 by INPUT Reproduction Prohibited

IV

Electronic Commerce Market Size and Forecast

A

Electronic Commerce—Expanding Scope

INPUT's electronic commerce program has focused traditionally on EDI and is well grounded in knowledge in this area, especially as it relates to business process reengineering, outsourcing, and client/server architectures within industry sectors. It becomes clear, however, that as technology and applications evolve, this focus is too narrow. E-mail, once used for informal communication within a company, is now being used between companies for the execution of business. This is electronic commerce. Likewise, documents sent by fax used not to be considered legal. Now, however, legal transactions are completed by fax, and this is electronic commerce also.

INPUT defines electronic commerce as "the completing of transactions electronically, over digital networks." It is the networking of business applications and work flows to support trade among companies. Today, INPUT's definition of electronic commerce has broadened to recognize current reality, and the fact that a complete business transaction may, at various times, move back and forth between trading partners, using a variety of media. This point is eloquently illustrated in the following paragraphs excerpted from a paper written by Dr. H.-P. Plotsender, President of Quadron Software International (with permission):

> *"... electronic commerce is defined as the concept and means of doing business electronically. This implies the reduction of paperwork with the objective of moving toward the paperless office ... E-mail, work flow, EDI, image processing and other office automation; all embedded into a comprehensive set of facilities that insure information security. In this context, X.400 and X.435 play*

1995 by INPUT Reproduction Prohibited

an increasing role. E-mail is generally defined as the electronic exchange of interpersonal messages. Now, more and more vendors of E-mail products provide gateways to external mail systems such as the Internet and CompuServe, or value-added network services such as IMX of Advantis, an alliance between Sears and IBM. Fischer International and Motorola also include the ability to send E-mail messages to pagers.

"Work flow automation provides tools for automating work processes throughout an organization. In a work flow application, the key ingredient is process. For instance, a purchase requisition needs to be approved, routed to the purchasing department and supported by requests for quotations from several vendors (via EDI). This has to be followed up by comparing the purchase order, shipping notice, actual delivery and invoice data and routed to the appropriate departments including accounting. Advance packages are object-oriented by combining documents and data with processing rules in cells, transported from user to user on multiple systems invoking routines such as spreadsheets, EDI translators, CAD/CAM functions, custom business applications and systems to spin off interpersonal messages. Databases can track the status of work flow processes and are outstanding tools for reengineering business processes, in particular, for stimulating work flow procedures prior to implementation.

"EDI is focused on the enterprise exchange of business data generally defined as computer-to-computer exchange of structured business documents. Advanced communications protocols such as X.400 and X.435 facilitate the shipping of envelopes with mixed contents, structured EDI and unstructured E-mail messages together with other data files. The integration of the above-mentioned office automation tools opens up new dimensions of benefits for doing business electronically, particularly in terms of service differentiation, increased responsiveness to customers and improved ability to target new opportunities."

This quotation represents the point of view regarding the role of messaging and other electronic commerce submarkets in providing solutions to business process communication problems within a corporation. INPUT expects to see more and more companies entering this marketplace and embracing the term "electronic commerce" in the future as they extend and integrate their product offerings.

© 1995 by INPUT Reproduction Prohibited

Specifically, INPUT considers the following activities electronic commerce *if they are supporting inter-company communication for the purpose of initiating, promoting and completing business transactions:*

- E-mail
- Electronic data interchange (EDI)
- Electronic funds transfer (EFT)
- Automated clearing house (ACH)
- Credit information
- Fax
- Electronic catalogs
- Sales and marketing information

Additionally, sales of relevant software products, equipment and professional services are included.

Not included are revenues to the credit card industry. These do not relate directly to the communication aspects of the services. However, credit inquiries in relation to transactions are included. Commerce executed using the "voice forms" capability of voicemail products is considered electronic commerce, but is too small to count at this time. It may grow and be counted in future years. Charges associated with business done by telephone are not included.

© 1995 by INPUT Reproduction Prohibited

B

Electronic Commerce—1994 Market and Forecast Summary

Exhibit IV-1

U.S. Electronic Commerce Market

	1993 ($M)	1994 ($M)	1993-1994 Growth %	1999 ($M)	1994-1999 CAGR %
Network Services					
Network Application Services					
E-mail	520	582	12	1776	25
EDI	252	300	19	658	17
FEDI/ACH/EFT	17	24	41	60	20
E-fax	120	148	23	1051	48
Subtotal	909	1054	16	3545	27
Electronic Information Services					
Credit Data	1475	1534	4	1866	4
E-catalogs/Product pricing	175	243	39	605	20
Marketing Data	647	738	14	1485	15
Subtotal	2297	2515	9	3956	9
Software Products	362	471	30	1437	25
Equipment	500	600	20	1105	13
Professional Services	50	61	22	165	22
TOTAL	4118	4701	14	10208	17

The U.S. electronic commerce market, with its constituent components as shown in Exhibit IV-1, was measured by INPUT to be $4.7 billion in 1994, growing from $4.1 in 1993. This was a growth rate of 14%. Note that some segments of the market are growing much more quickly than others. In particular, the credit data segment is a mature market, and growing rather slowly. However, in view of its size, it has a rather large effect on the total growth. If credit data is excluded, the one-year growth rate for the remaining market is a more robust 20%.

Over the five-year period to 1999, growth continues, although at a slightly moderated compound rate of 17%. If the mature credit data market is excluded, the CAGR would be a very exciting 22%.

From 1994 to 1999, the strongest growth area will be enhanced fax at 48%, followed by software products at 25%.

A number of factors influence INPUT's market forecast for electronic commerce. INPUT's forecast for the U.S. information services market is a 12% compound annual growth rate (CAGR) for the period 1994 to 1999. Last year, electronic commerce was estimated to be growing at 13% (19% if credit data is excluded), as noted in INPUT's annual report. A survey of

© 1995 by INPUT Reproduction Prohibited

vendors regarding growth in expenditures for electronic commerce provided estimates that varied greatly—from 10% to 50%, with the average being 22%. Selected vendor growth rates varied, but it was apparent that the telecommunications vendors would experience considerably more growth in electronic commerce on the average than any software vendors or any traditional electronic commerce vendor, except for GEIS and Sterling. This may be expected, as the telcos are growing from a smaller base (in electronic commerce) in 1994.

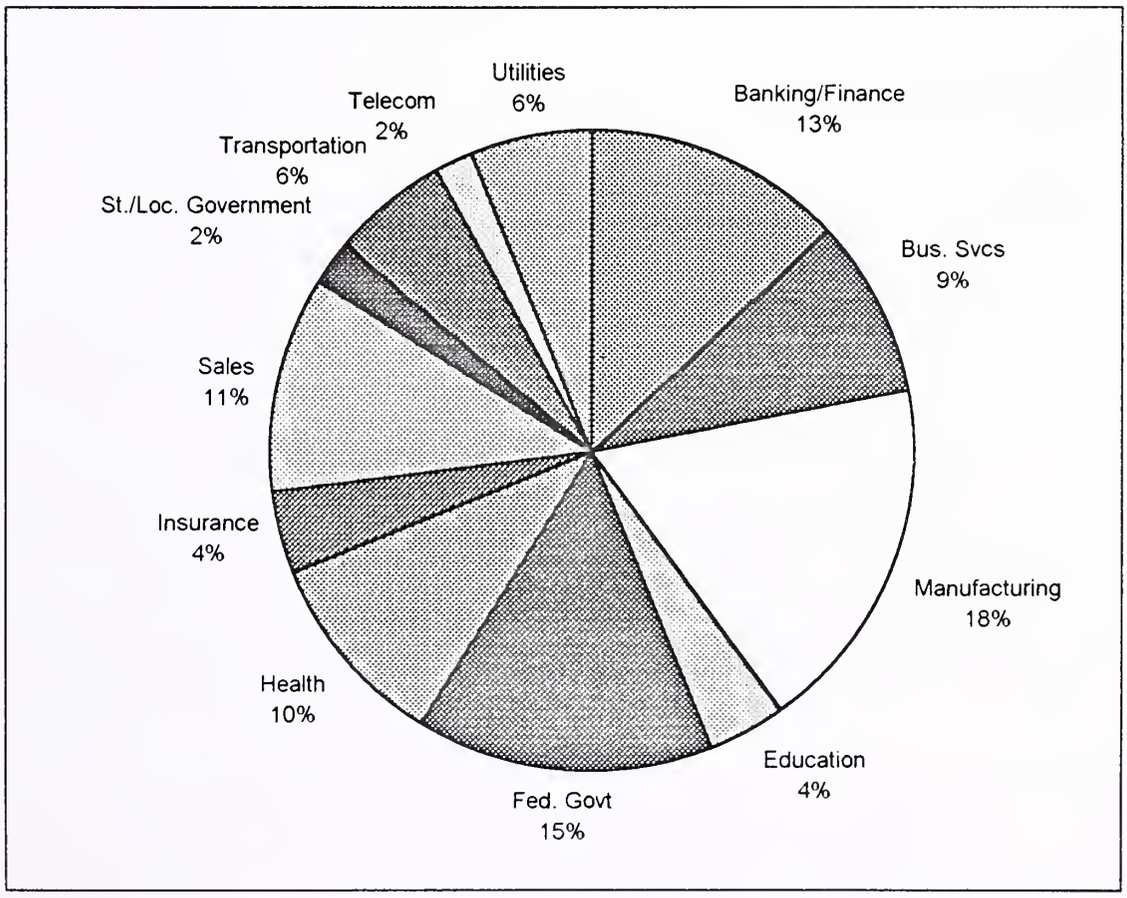
It is clear that the electronic commerce market is in the "growth tip" of information services, and that rapid market expansion, despite sluggish economies (as was mentioned earlier), can be expected.

C
Electronic Commerce by Industry Sector

Exhibit IV-2 provides the 1994 industry breakdowns for the electronic commerce market.

Exhibit IV-2

1994 EC Market by Industry Sector



Source: INPUT

© 1995 by INPUT. Reproduction Prohibited

Banking and finance, large though it already is at 13% of the total, represents a major growth area for the future, as home banking, especially bill-paying, takes hold. Much of the EFT growth is in this sector. Citibank is taking the lead to financially motivate its retail customers to use home (PC-based) banking as a way to reduce its teller costs.

Manufacturing, at 18%, is the biggest contributor to traditional EDI, and will grow in line with the total market.

The federal government, at 15%, is perhaps a surprisingly high figure, given that overall federal government expenditures for network services is only 9% of total U.S. network services. The reason, however, is because of initiatives going on in government for business process reengineering under the rubric of "reinventing government." This effect will continue in future years, and is described in a companion INPUT report, *Electronic Commerce in Government.*

Telecom, at 2%, is relatively low because of entrenched ways of doing business with established suppliers and little motivation to modernize. The telcos anticipate being major vendors of EC services in the future, and therefore may well adapt to use their own services.

D
E-Mail Market Size and Forecast

In electronic commerce, INPUT considers not all E-mail (which would be a very large figure), but only E-mail used between companies for the purpose of executing commercial transactions. Dollar amounts for this market are calculated based on the proportion of inter-company messaging that uses standard E-mail and workflow packages (such as Lotus Notes/cc:Mail, SoftSwitch, PROFS, etc.). Also included in this market are software packages that are aimed directly at inter-company E-mail, such as Commerce Connection from Sterling Software and Business Talk from GE Information Services.

With this definition, E-mail within electronic commerce is expected to grow as shown in Exhibit IV-3.

© 1995 by INPUT Reproduction Prohibited

Exhibit IV-3

E-Mail Market Size and Forecast

	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	1999 ($M)	CAGR %
E-mail	582	685	849	1030	1320	1776	25

The growth rate will be higher in latter years (34% in '98-'99), as E-mail gets more accepted for "official" inter-company communications. At that point, the distinction between E-mail and EDI (which is only structured E-mail, after all) will become blurred. Between 30% and 50% of users surveyed earlier by INPUT were found to be using E-mail with EDI trading partners. This practice improved communication with customers, enhanced accessibility, prevented problems and resolved technical issues in utilizing EDI systems. Most of these users claim to have integrated messaging platforms (see below).

Depending on the ability of the E-mail vendors to accommodate requirements for EDI users, they may or may not take substantial business away from traditional EDI vendors. The messaging vendor needs to overcome its lack of industry sector knowledge as well as its lack of understanding of the special problems of marketing and developing appropriate EDI software and services. EDI has typically been considered a difficult area in which to work and, for that reason, vendors have had a certain amount of control over their marketplace. Today, the EDI vendor's knowledge of EDI, as it applies to industry sectors, is its greatest asset, which it should be encouraged to market in some form to customers and/or competitive vendors.

The trend in this marketplace is toward integrated messaging—the sending and receiving of multiple message types (voice, data, image and video) through a common system, platform or interface where the message types remain in separate files. This is distinct from multimedia, which is multiple data types in a single file, simultaneously accessible through the same interface. Various groups of vendors are converging on the integrated messaging marketplace.

The E-mail market consists of two types of vendors: those providing messaging services for inter- and intra-company mail, and those providing software products that are primarily PC- and LAN-based. The former group is led by MCI, Sprint, CompuServe, AT&T and IBM (Advantis and Prodigy). Other older, host-based messaging suppliers

1995 by INPUT Reproduction Prohibited

include IBM, Digital, Dun & Bradstreet, Computer Associates and other mainframe software vendors.

The latter group, including Microsoft, Apple, Lotus, Novell, Borland, and Da-Vinci, have moved their products from end user through office work group to become providers of enterprise-wide systems as well.

E-mail usage has grown, based on the installed base of E-mail boxes. E-mail boxes are established on a local-area network or a host-based machine. Host-based systems are typically privately owned by the company of the E-mail user, or owned by a commercial E-mail service provider; users dial into the host through dial-up or dedicated lines. Most host-based E-mail boxes through commercial providers are for consumers or individuals. The number of E-mail users does not linearly correspond to E-mail network traffic, software sales or service revenues. Recently, many networks switched to "fixed fee" pricing.

The highest growth in E-mail continues to come from users linking PCs or workstations to those of colleagues in their places of work via local-area networks (LANs). This is a result of massive installation of PCs in the workplace over recent years. The market is now in the process of linking machines together in networks, hence the high growth rate of LAN-based E-mail boxes. At this point of market development, both LANs and PCs are commodity products with very thin margins. Growth in E-mail revenues stemming from LAN-based E-mail will reflect mass use, but will not contain wide margins in the future. What will continue is the growth in LAN connections to the network and, thus, integration of LAN-based systems in network services will expand.

Messaging standards are necessary for software development around a common set of procedures. X.400, part of the open systems interconnection model, has been implemented by large network operators and is being rapidly adopted by vendors seeking to provide services globally. X400 may be a challenge for the traditional EDI vendors. NetWare global messaging and SMF is based on Novell's MHS standard for E-mail over local-area networks. MHS is a *defacto* LAN standard for E-mail, and its descendants certainly will continue to be used widely. MAPI (Messaging Application Programming Interface) is Microsoft's E-mail standard. Apple Computer promotes Open Collaborative Environment (OCE), and VIM (Vendor Independent Messaging) is a messaging standard proposed by a consortium of Borland, Apple, Lotus, Novell, IBM and others. Very few respondents surveyed by INPUT were actually yet using X.400 messaging.

© 1995 by INPUT Reproduction Prohibited

Internal E-mail networks can also be used for the transfer of fax and messages using the TR.29 binary file transfer standards. E-mail boxes can also be interconnected to a user's voice mail box so that users can be informed when E-mail messages arrive in the E-mail box on their voice mail. E-mail cannot be retrieved through the phone, however. This would require speech-to-text technology, which is only now being used in experimental systems.

E-mail and groupware overlap. E-mail has the basic functionality of sending and receiving messages, where groupware enhances basic message transport capability with additional communication services to the end user: message routing, filtering, functional process orientation, access to specialized databases,etc. Workflow is often associated with E-mail, but tends to provide more of a planning or development function in the flow of work on the system.

E

EDI Market Size and Forecast

EDI, as categorized under network application services, does not include sales of EDI software, which are considered under software products, below. Exhibit IV-4 shows the growth in the EDI market through 1999.

Exhibit IV-4

EDI Market Size and Forecast

	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	1999 ($M)	CAGR %
EDI Services	300	357	421	493	571	657	17

As will be seen, growth is robust and fairly steady, though slightly declining over the period. This is due to other modes of electronic commerce taking over (e.g., E-mail and EDI provided by the user company over a private network).

In a survey of 141 users of EDI products and services conducted for this report, forty-five percent stated that they planned on spending more for their EDI services in the coming year. Twenty-eight percent said they would be spending substantially less on EDI services.

Traditional EDI vendors are very strong in the United States and their knowledge of industry sectors, as has been stated previously, is one of their greatest strengths. EDI vendors will increasingly view their

1995 by INPUT. Reproduction Prohibited.

specialized knowledge as something worth—selling, not only to customers, but also to other vendors seeking to expand to new markets.

Downsizing, business process reengineering and client/server trends will continue to influence EDI positively, as well as the electronic commerce marketplace in general. Continued positive return on investment for information systems of these sorts will be seen. Furthermore, business process reengineering and client/server architectures signal an increased adoption and acceptability of the open systems approach. Therefore, EDI and E-mail vendors will continue their trend toward providing open systems-based products and services. The result will be fewer standalone systems in the future.

EDI usage will also increase as electronic commerce functionality becomes embedded in network operating systems.

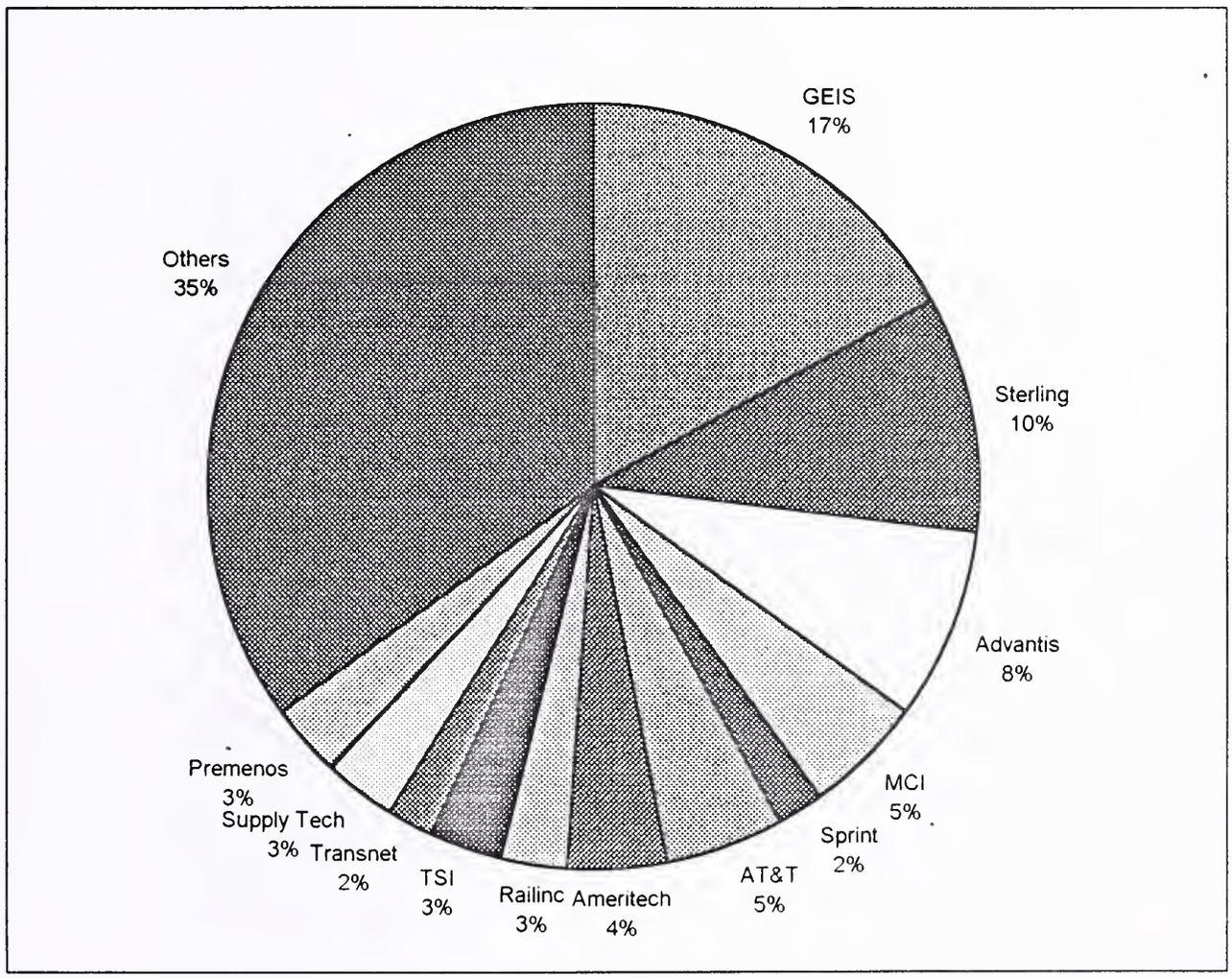
The leading players in EDI network services include GEIS, Sterling Software, Advantis, Rail Inc., Kleinschmidt, Harbinger, and TransNet.

Telecommunications vendors such as MCI, Sprint, AT&T, Ameritech and major computer companies have participated in the EDI market for a long time. However, their EDI revenues are a very small part of their overall business. Although they have the potential ability to fund development of these services at high levels, and take major market shares, they are aware that they do not understand the business as well as their smaller rivals, and they view the opportunity as a series of niches. It should not be assumed, therefore, that they will necessarily prevail in the market. This is important to users and vendors alike, in that the perception that a mighty competitor exists may not be reality when the actual program or product line is examined more carefully. There will, however, be customers attracted to major companies simply because of who they are. Market share by vendor is shown in Exhibit IV-5.

© 1995 by INPUT Reproduction Prohibited.

Exhibit IV-5

1994 EDI Market by Vendor Share



Source: INPUT

Communication over the Internet by users having purchased their own EDI software is clearly a competitive threat for EDI network providers.

In the INPUT survey for this report, users were asked what their status was regarding the Internet. Over 90% of these EDI users did not use, nor planned to use, the Internet for any purpose. A small portion used it internally. This finding results from the belief that the Internet is not particularly secure and rich in functionality for high-level corporate use. This perception will probably change over time as the Internet evolves, and as understanding increases.

Additional findings from the survey included:

1995 by INPUT Reproduction Prohibited

- 65% found EDI and fax to be extremely useful in communicating with customers or suppliers. This group did not find E-mail particularly useful at this time.
- 91% of the users in this group used EDI for inter-company activity (doing business with trading partners). Only 4% used it strictly for internal communication purposes.
- Only 16% used electronic funds transfer or FEDI at this time.
- When asked about the success that they have been having with their EDI systems, more than half said that they did not have any problems at all. The others had a variety of problems, mostly in implementation.
- Business process reengineering led to the adoption of EDI in less than 15% of the cases. Others were forced into adopting EDI by their trading partners.

F
ACH/EFT/FEDI Market Size and Forecast

The Automated Clearinghouse (ACH) is a national electronic payment network and run by the National Automated Clearinghouse Association in close coordination with the U.S. Treasury Department, the Federal Reserve and other major industry groups. The ACH is used by over 160,000 companies, millions of consumers, and reaches 15,000 credit unions, banks, and savings and loans. Transactions supported by the ACH system include:

- Point-of-sale services
- Disbursement funding
- EDI payments
- ATM settlements
- Direct deposit to bank accounts
- Pre authorized payments
- Cash concentration
- Check truncation
- Customer-initiated entries

1995 by INPUT Reproduction Prohibited

A transaction will be triggered by the authorization of an electronic entry. Companies then create and send electronic entries for collection or payment to their financial institution. An originating financial institution processes all transactions to be posted to its own accounts and produces an automated file for other items and sends them to the ACH. The ACH validates, balances, and prepares entries for receiving institutions. This is the clearinghouse function. The receiving institution then validates and balances the entries, and debits or credits individual or company accounts as appropriate. The receiving institution also includes ACH transaction information on descriptive statements to individuals and companies. EDI, FEDI (financial EDI), and electronic funds transfer (EFT) can all be conducted by the ACH.

EDI has been defined previously as computer-to-computer exchange of business data in structured formats. Financial EDI is EDI in the generic sense, but the information carried relates to the finance function and the system structure often includes transmission to banks. Examples would be its use for payment orders, balance inquiries and lockbox information. Electronic funds transfer (EFT) is a similarly structured and formatted type of information transfer, but the information is passed bank to bank. The results of the transaction are value transfers, debits and credits. A value-added bank, which is often associated with these financial functions, supports both EDI and FEDI. The information is passed from the firm to the bank and back to the firm, and often involves the processing of purchase orders and invoices for customers. The ACH/FEDI/EFT marketplace was measured by INPUT at $24 million in 1994, growing to $60 million by 1999. This is shown in Exhibit IV-6.

Exhibit IV-6

ACH/FEDI/EFT Market Size and Forecast

	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	1999 ($M)	CAGR %
ACH/FEDI/EFT	24	31	37	45	52	60	20

The 20% growth rate is an area of concern for banks that are currently engaged in EFT, because they believe (correctly) that it lags behind the vision of organizations such as Microsoft and Intuit, and they might get usurped. Customers asking banks to engage in EDI are on the increase and have been for several years. The banking area has been one of the last industry sectors to engage in EDI, due largely to the fact that EFT systems were in place. As the banking industry has undergone a certain

1995 by INPUT Reproduction Prohibited

amount of consolidation it has been faced with the need to offer EDI by customer requests, thus in some respects making traditional EFT systems less useful. All of this is to suggest a natural migration of technology from EFT to EDI (and assuming parallel E-mail systems) as the financial market itself begins to consolidate.

There is, however, a concern that electronic commerce systems in general have not been deployed throughout the banking and financial arena to the extent necessary and possible. A few traditional EDI vendors have penetrated the top-echelon (50) banks in the country. However, the next tier of banks has not adopted electronic commerce to the same extent. Consequently, the flow of banking information as required by the federal government is being hampered by the mid-range to smaller banks. This will eventually be detrimental to the banking industry as a whole. Initiatives by NACHA are being put in place to facilitate the implementation of EDI in a broader range of banks and, as a result, competitive banking associations have appeared that may be a signal of improvement (although note that this eventuality is not factored into INPUT's forecast). Opportunities for new entrants into EDI, EFT and FEDI in the banking sector may be limited during this period. Electronic commerce vendors who are interested in penetrating this area would be assisted by obtaining industry contacts and customers from established institutions via strategic partnerships.

G
E-Fax Market Size and Forecast

Facsimile technology has the most promise of all messaging modes today to grow to the largest number of users. Fax capabilities continue to grow beyond the conventional facsimile of today, enabling these other messaging types, especially E-mail, voice mail and video mail, to be merged into multimedia messaging (referred to as enhanced fax, or E-fax).

Throughout the world, 25 million fax machines are being used by over 150 million people. Almost all are interconnected by the worldwide public phone network and can interoperate thanks to consistent fax standards. Fax is becoming the communication mode of choice; this is even more so in Europe and the Pacific Rim than in the U.S.

Fax has "critical mass" advantage over other media because it has a large and more rapidly growing installed base of users, is simple to use, and is simple to administer as a corporate asset. It can always be ready to accept incoming messages, 24 hours a day, is inexpensive, affordable even

© 1995 by INPUT Reproduction Prohibited

for households, and is scaleable and expandable in large volume and range of messaging through additions of software, modular hardware and telecommunications services.

Fax server and fax cards grow rapidly and, in so doing, have ushered in advanced fax messaging. Rather than send bit-mapped images, advanced fax messaging sends binary files between points that can be reinserted into applications and other systems for further processing and user manipulation. Fax evolution began in the late 1970s with standalone turnkey fax machines and is now at the stage where single PCs act as fax machines. We will continue to see rapid growth in fax servers where many PCs on a network use a fax server as a fax communications port. Finally, with the adoption of TR.29 and other binary file standards, fax servers will be used to send E-mail, EDI, video, voice mail and other digital files. High-volume faxing redirects data in the host print file to the fax server. The technology combines the immediacy of fax delivery with the tracking capabilities of a host system. High-volume automated fax is cost-justifiable for sites that send at least 75 documents per day.

Computer-based faxes, primarily IBM AS/400, RS6000s and LAN server-based automated fax products, have the potential to produce cost savings, yet at this time are not very widespread. Sales of automated fax products will increase 138%, from 5.1 million to 12.1 million units between 1993 and 1997. Sites can save from $15,000 to $100,000 annually over the cost of manually faxing business documents.

Standalone fax machines have been called "the water coolers of the 90s." Not withstanding any social benefits of this phenomenon, the perceived inefficiency and aggressive price cuts are fueling the market for fax modems, LAN fax servers and centralized fax servers. Integration of fax with data and voice, the growing mobile computer market, and the emergence of desktop PCs as communication nodes are also helping to develop this emerging market.

Although automated AS/400 fax is fairly mature, vendors are working to enhance products by making the interfaces more intuitive, allowing split-screen displays, and offering fax on demand. Fax on demand allows customers to call the vendor's system, interact with a voice processing system and indicate what information they want through voice commands or push-button phones. The information is then faxed to the customer.

© 1995 by INPUT Reproduction Prohibited

Another addition to automated fax is a Windows environment equipped with the ability to switch to the fax application without disconnecting from the AS/400 session.

LAN fax servers typically cost less than products designed to run on the AS/400, while offering the same stable function as their AS/400 counterparts. The relative openness of the hardware encourages vendors to explore more advanced features, including in-bound routing and binary file transfer and management. The most popular routing technique is direct inward dialing, in which a company uses a trunk line to support multiple virtual numbers on a single telephone line.

Binary file transfer (BFT) is another developing technology that requires two BFT-capable fax servers. Rather than convert the document into digital format for transfer from fax to fax, BFT transmits the document in its original format so the receiving computer gets a file that can be manipulated. BFT is in its infancy.

In addition to the products mentioned above, there is a rapidly growing network services market for fax. The telephone companies, in particular, are developing this market to provide services such as bulk fax delivery, fax on demand, "never busy" fax, guaranteed fax delivery, and fax store and forward (fax mailbox). They are using specialized fax servers and equipment with voice mail heritage for these purposes.

However, not all of the above fax products and services can be counted within electronic commerce. Some years ago, fax was used only for informal communication between trading partners. Although the situation was never clear, fax documents were not considered "legal" and were only used for the logistical activity leading to the mailing of the official document. To a degree, this situation is still the case, though it is slowly changing. INPUT's calculation of the use of fax in electronic commerce only counts the usage of services inter-company for the initiation or facilitation of a commercial transaction (similar to INPUT's algorithm for counting E-mail within electronic commerce). On this basis, the following is the market size and forecast for E-fax (Exhibit IV-7).

© 1995 by INPUT. Reproduction Prohibited

Exhitib IV-7

E-Fax Market Size and Forecast

	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	1999 ($M)	CAGR %
E-Fax	148	220	301	480	670	1051	48

As indicated, the growth rate for network-based E-fax is extremely large, at a 48% CAGR. This growth accelerates over the period. At the end of the period, E-fax ($1,051 million) is larger than EDI ($657 million).

H

Credit Data Market Size and Forecast

Credit data involves activity at the point of sale (POS), where payments for purchases of personal consumption items are made via credit or debit cards. Merchants increasingly are integrating credit and debit card functionality at the POS. INPUT estimates that in 1994, the credit data market was worth $1.5 billion. This includes the value of communication services and software, as well as processing fees. This does not include the value of charges made by consumers for purchases. Growth over the period to 1999 is shown in Exhibit IV-8

Exhibit IV-8

Credit Data Market Size and Forecast

	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	1999 ($M)	CAGR %
Credit Data/POS	1534	1595	1659	1725	1794	1866	4

Although the credit data/POS market is very large, it is also very mature, and consequently only growing at the rate of the nation's gross domestic product (GDP). The barriers for entry are also large for potential new participants, and as a result it is not expected that significant new entrants will be seen. However, this does not rule out the possibility of major discontinuities in the market that could result from the emerging global telecommunications infrastructure (the information superhighway).

Various types of credit cards exist: phone company cards, bank cards (VISA/Master Card), oil company cards, retail store cards, T&E (travel and entertainment) cards, affinity cards and others. Leading vendors in

© 1995 by INPUT Reproduction Prohibited

this market have included National Data, NaBanco, FDR/AMEX, MCI, VISA, and MasterCard.

There is a rapidly growing interest in POS services on the debit side. The consumer's demand deposit account is accessed through a device (card and/or terminal) at the point of sale. That device is connected to an electronic payment system infrastructure that involves telecommunication services, authorization, data capture, and payment settlement. Off-line debit POS allows the purchase to be made with a bank card, and on-line debit allows the purchase to be made with an ATM card. Debit growth is most rapid in the retail sector, especially in the grocery and oil industries.

The major organizations operating networks for credit/debit processing include: Interlink, Explore, First Interstate, MAC, Honor, Cactus, The Exchange, MOST, Pulse, and Genie. POS users are largely age 35 to 55, but are well distributed across income categories.

Banks will continue to own merchant relationships for traditional banking services and will insource services critical to that relationship. Banks will outsource system-intensive processing, and non-traditional players, including RBOCs and AT&T, will continue to enter the business to compete for some of that outsourcing business.

A related market includes draft capture processing, which is a subsegment of the credit transaction service processing area. Traditional players in this market have included:

- J.C. Penney
- BuyPass the System
- National Data Corp.
- Envoy, Sears, NaBanco
- First Data Resources
- VISA
- TransNet
- MCI
- MasterCard

© 1995 by INPUT Reproduction Prohibited

- Discover

The debit card processing sector is dominated by a subset of the above list, and third-party debit card processors, including:

- Arco PayPoint
- Deluxe Data
- CoreStates/BuyPass
- Concorde Computing
- National Data Corporation

Successful third-party debit card processors must work closely with merchants, debit networks and ACH banks. Understanding the needs of individual participants is key to profitability.

Overall growth in debit card use will be somewhat faster than in the credit card area. The most rapid type of debit growth will be in the EFT transactions/cash withdrawal area. Electronic commerce providers concentrating on EDI and messaging, but wishing to expand their offerings, need to examine these marketplaces and understand them as a subsector of electronic commerce and not necessarily simply as a factor in the retail sector market. The processes involved in point-of-sale services cut across industry sectors and, in some respect, transcend the need to understand the details of industry sector business processes.

I

Electronic Catalog Market Size and Forecast

Electronic catalogs are being used today for merchandise materials procurement as well as information gathering and research. They come in diskette, CDROM and on-line formats that involve interactions between manufacturer and single-vendor clients or distributors and multivendor clients. Catalog vendors have marketed directly to industry while others have represented the information technology industry.

Some of these catalogs include universal product code (UPC) catalogs that are used to coordinate POS systems with UPC codes. Others interface with CAD systems to generate information for manufacturing. Single-vendor catalogs are used for direct sales and are usually linked to an EDI system for ordering. Multivendor catalogs have often been developed in

© 1995 by INPUT Reproduction Prohibited

partnership with trade associations. Many electronic catalogs are developed for regional distributors of particular types of products.

Revenues for electronic catalog services stem from subscription fees from buyers, listing fees to sellers, or percentages of sales for every transaction.

Exhibit IV-9 shows that the market for electronic catalogs is $243 million in 1994, and growing at a very rapid 35% rate (1994 to 1995). Over the five-year period, growth moderates somewhat to 20%, bringing 1999 revenues to $605 million.

Exhibit IV-9

Electronic Catalog Market Size and Forecast

	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	1999 ($M)	CAGR %
Electronic Catalog	243	328	402	470	540	605	20

The traditional catalog companies represent a core group of electronic catalog providers. Examples include Lands End, Spiegel, Lillian Vernon, Blair Corp., the catalog retailers (such as J.C. Penney, Williams-Sonoma and The Sharper Image), and television marketers (QVC Network, Home Shopping Network, National Media Corp. and Regal Communication Corp.). They are all focused on consumer markets.

Manufacturers and distributors choosing to use this medium include Wilco, Brodart Co., DEC, Air Inc./American Transport Association, and Auto Info.

Catalog software vendors cater to direct marketers, database marketers and catalog order takers. Their software creates databases of buyer names, and assists in telephone or direct mail order taking and mailings. Examples include Sigma Corporation, Smith Gardner & Associates, and Nashbar/Associates, Inc.

List brokers sell subscriber or membership lists. They will sell the advertising in publishing and direct media. TCI, TV List Management and Ziff-Davis List Services are examples.

Nontraditional electronic catalog providers are exemplified by information technology vendors such as Triad Systems Corporation, Info Enterprises (a Motorola company), QRS Quick Response Services, and start-up electronic catalog service entrepreneurs such as Automated Catalog Services, Vertical Technologies and others.

© 1995 by INPUT. Reproduction Prohibited

J

Sales and Marketing Data Market Size and Forecast

Electronic capture and sale of sales data for marketing purposes is a growth market that started a decade ago with the collection of information from grocery store scanners, and the sale of this data back to the manufacturers.

The scope of this business is much greater now, with many more transactions being performed electronically (for example, by EDI).

At present, it is primarily consumer data that is being collected in this manner, typically from sales of auto parts, books, movie tickets, pharmaceutical, electrical, agricultural and other consumer products. Exhibit IV-10 shows the market size for this type of electronic product.

Exhibit IV-10

Sales and Marketing Data Market Size and Forecast

	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	1999 ($M)	CAGR %
Sales and Marketing Data	738	845	967	1107	1273	1484	15

K

Electronic Commerce Software Products Market Size and Forecast

Although most of the revenues in electronic commerce are generated in network services, there is a considerable market also for the sale of software to organizations that use a private network between partners for EDI and other transactions. This market grew to $471 million in 1994, a growth of 30% over 1993. About 40% of these sales were for EDI software, with another 40% for E-mail (used between trading partners).

As Exhibit IV-11 shows, the growth in this market will continue at a strong 25% through 1999.

© 1995 by INPUT Reproduction Prohibited

Exhibit IV-11

EC Software Products Market Size and Forecast

	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	1999 ($M)	CAGR %
Software Products	471	588	736	919	1149	1437	25

EDI software performs file translation, mapping, communication, and application program interface, and stores and forwards messages. UNIX-based translation software continues to enjoy strong acceptance and is growing more rapidly than PC midrange and mainframe EDI software.

PC EDI software accounts for the largest portion of the software market, with Supply Tech and TSI the leading vendors in this area. PC software, along with mainframe software, makes up approximately 80% of the marketplace. Sterling Software is the recognized leader in the mainframe area. Sterling Software purchased ABC this year, which at the time was considered the leader in UNIX-based EDI software.

The smallest portion of the software market is for midrange software. Premenos is the recognized leader in this area, with Sterling Software also making substantial sales.

L

Electronic Commerce Equipment Market Size and Forecast

Equipment purchases related to electronic commerce include computer platforms, modems, routers and related telecommunications equipment. Often, this equipment is used both for internal corporate functions and for inter-company electronic commerce functions. Attempts have been made to allocate accordingly, but the figures are, nevertheless, approximations. Exhibit IV-12 shows the sales of equipment for electronic commerce.

Exhibit IV-12

EC Equipment Market Size and Forecast

	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	1999 ($M)	CAGR %
Equipment	600	678	766	866	978	1105	13

1995 by INPUT Reproduction Prohibited

M

Electronic Commerce Professional Services Market Size and Growth

Professional services for electronic commerce are third-party consulting and systems integration services performed to build electronic trading systems.

Key providers here are the Big Six companies, smaller consulting firms and value-added resellers (VARs).

The market for professional services for electronic commerce is shown in Exhibit IV-13.

Exhibit IV-13

EC Professional Services Market Size and Forecast

	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	1999 ($M)	CAGR %
Professional Services	61	74	91	110	135	165	22

1995 by INPUT. Reproduction Prohibited

(BLANK)

1995 by INPUT. Reproduction Prohibited

V

Electronic Commerce Players' Perceptions of the Marketplace

A
Electronic Commerce Survey

One hundred and sixty eight companies were surveyed regarding their perceptions of the electronic commerce market environment. Participants were contacted both in writing and via telephone. Both vendors and users were included.

B
Perceptions of Market Growth

Companies that experienced strong growth in electronic commerce or perceived that the market was growing at a substantial rate outnumbered those with a negative view of the market by a ratio of two to one. The reasons given included:

- Perceptions of improved customer satisfaction
- Positive impacts of the Internet
- Cost efficiency of doing business with electronic commerce products
- The movement to reengineer business processes
- Lower prices
- Improved understanding of the need for on-line communication systems
- President Clinton's mandate for a federal communications network
- The work of Microsoft in bringing electronic commerce to consumers

© 1995 by INPUT. Reproduction Prohibited

- Increased deployment of PCs, particularly in the home

Most likely, all of these perceptions have had an impact, and the growing effects of their interactions will continue to be felt over time. Related growth rates experienced by vendors ranged from 10% to 50%. Only a small number of vendors did not report growth. Customers were believed to be more serious about electronic commerce and interested in moving from basic tools to mission-critical applications. It was also noted that network traffic has increased by 35% to 40%.

C
Impact of Key Technology and Portfolio "Events"

Respondents were asked what events had recently happened in the world of EC that were specially significant. Some of the responses noted as technology events were really standards related. Some respondents felt that E-mail standards were instrumental in preventing one company from dominating the entire marketplace. Encryption and digital signature standards were accepted, which was seen to have great potential to facilitate EC growth.

Other events perceived as important included:

- Connections between security/workflow
- The emergence of object-oriented programming
- Awareness of the possibilities for communication via the Internet
- Expanded connectivity of the Internet

In terms of portfolio events (or things that may have been added to the product line), a variety of things were mentioned:

- Calendaring and scheduling lines of products
- Integrated EDI/E-mail services
- Secure exchange
- UNIX-based products
- New versions of standalone products
- Backbone product expansion

© 1995 by INPUT Reproduction Prohibited

- Enhanced fax
- Workflow packages
- Mail manager
- E-mail connection software
- Internet switches

Some respondents also mentioned a general commitment to electronic commerce at a high level and saw the addition of new products and approaches to services as consistent with that commitment.

It should also be mentioned that almost all of the vendors interviewed had formed significant partnerships in the form of mergers, acquisitions, or alliances over the past year. All of them felt that these had a positive impact on their business and contributed to growth in the marketplace.

D
Significant Market Changes Over This Year

When asked what perceived market changes over the year were especially important, respondents mentioned most often the acquisition of Softswitch by Lotus. This effectively brings a second major business software vendor into the market. The largest such vendor, Microsoft, was frequently mentioned as having great impact in the market (for example, by incorporating EDI functionality into its Windows NT operating system).

Other significant changes included:

- WordPerfect being purchased by Novell, consequently giving Novell more application capability, and making NetWare (which includes EDI capability from Premenos) more prevalent.
- Sterling's purchase of ABC was a significant alliance, especially to traditional electronic commerce vendors. It brings together strong UNIX and mainframe software capability.
- Microsoft and Lotus were mentioned several times, as E-mail messaging vendors positioned to compete in the EDI market.
- Sterling, AT&T, and Supply Tech were mentioned as competition for traditional EDI vendors.

© 1995 by INPUT Reproduction Prohibited

- Bell Operating Companies (BOCs), Northern Telecom, AT&T, Sprint and MCI were mentioned by participants from the telecommunications area. There is concern that the resources of these companies could permit them to gain major market share, if they so choose.

- Microsoft, Lotus, Genie, Delphi, America Online, and CompuServe were mentioned, as representing vendors coming at this marketplace from the database submarket.

- Cisco, Wellfleet, Kaltana, and 3Com were mentioned by vendors focusing on interconnection devices and/or LAN messaging.

The entire competitive environment has seen significant change in the last year and will continue to be dynamic. The companies mentioned most often as likely to have major market impact include Microsoft, AT&T, Sterling Software, Isocore, OSIWare, Lotus, DEC, and IBM.

© 1995 by INPUT Reproduction Prohibited

VI

Conclusions

Many factors contribute to an understanding of the formation, size and growth rates of the electronic commerce market. The global business market and the U.S. business environment are two major contributors.

The North American economy has pulled out of the recession faster than the rest of the world, thus creating a lag in electronic commerce growth in Europe and the Asia-Pacific region as compared to the U.S.

Furthermore, a trend toward outsourcing, the ongoing business process reengineering activity and the trend toward client/server architectures continue, in INPUT's opinion, to be driving factors for much of the growth that is being witnessed.

The U.S., followed by Europe, leads the world in EC growth. This is largely due to the fact that the electronic commerce market relies on telecommunications network infrastructure. Where this infrastructure is strong, there is rapid growth of electronic commerce. Where an underlying telecommunications infrastructure does not exist, growth is hindered.

With a 25-year history, EDI has been a long-standing part of the electronic commerce marketplace. Over the years, EDI was expected to produce phenomenal growth rates, but never fully met expectations. In the context of electronic commerce, however, it is clear that EDI will continue to grow steadily as vendors reach out to other markets by expanding their portfolios, making their products more user friendly, and offering a full range of support services. EDI will no longer, in the future, be a hidden technology, but will increasingly enjoy a wide range of users and be offered by a wide range of providers.

Although E-mail is a relatively young market, it has begun to enter a consolidation phase, with many vendors beginning to reorganize and

© 1995 by INPUT Reproduction Prohibited

reorient their products. It is for this reason that messaging providers are looking to electronic commerce as a way of expanding their portfolios. Electronic commerce vendors coming from an E-mail orientation will have to develop a greater understanding of the details of business processes within industry sectors. Much of this knowledge is available from the traditional EDI vendors, and it is highly recommended that EDI software vendors interact with the messaging community through alliances and partnerships. The value of the knowledge of business processes within industry sectors is very high at this time, and EDI vendors would be wise to capitalize on this asset.

Fax, as enhanced by new technologies, shows tremendous promise as the technology base for new types of electronic commerce solutions. In fact, fax solutions may become the electronic commerce mode of choice in some parts of the world.

The growth of EFT and other banking systems, including financial EDI and use of the ACH, is strongly dependent upon the banking industry itself. Large banks, for the first time in their history, have had to respond to the customer requirement for EDI. This has produced an increased interest on the part of banks to implement electronic commerce. Sterling Software has about 30 of the top 50 banks as its electronic commerce customers. In contrast, the smaller banks have not widely adopted electronic data interchange. They are a bottleneck in the system, and information is not flowing between high-end banks and others as it needs to. This threatens the banking industry overall, as organizations such as Microsoft aspire to fill the void.

© 1995 by INPUT Reproduction Prohibited